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SEQUENCE LISTING

TECH CENTER 1600/2900

<110> PhageTech, Inc.

<120> Compositions and methods involving an essential Staphylococcus Aureus gene and its encoded protein

<130> 21715/1010

<140> US 09/689,952

<141> 2000-10-12

<150> US 09/470,512

<151> 1999-12-22

<150> US 09/470,804

<151> 1999-09-28

<150> US 60/110,992

<151> 1998-12-03

<160> 19

<170> PatentIn version 3.1

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<212> DNA

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<213> Staphylococcus aureus

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gcagaacgtc atacacgccc cgctatcgtc gaatattaa 159

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<211> 52
<212> PRT
<213> Staphylococcus aureus

<400> 5

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Tyr Ala Gln Lys Leu Ile Asp Glu Ala Gln Gly Asp Glu Asn Arg Leu
20 25 30

Tyr Asp Leu Phe Ile Gln Lys Leu Ala Glu Arg His Thr Arg Pro Ala
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Ile Val Glu Tyr
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<210> 6
<211> 1362
<212> DNA
<213> Bacillus subtilis

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cagcgcaacg acttgatcat tgtggctgcc cgtccttcag tagggaaaac agcctttgcc	660
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 <213> Staphylococcus aureus

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gagtcgtttt ataggggtgc ccatcaacat attttcogtg caatgatgca cttaaatgaa	180
gataataaag aaattgatgt tgtaacattg atggatcaat tatcgacgga aggtacgttg	240

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aatgttcagt attatactga tatcgtttct aagcatgcat taaaacgtag attgattcaa      360
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gacattcgag acgtcttagg acaagtgtat gaaacagctg aagagcttga tcaaaatagt      540
gggtcaaacac caggtatacc tacaggatat cgagatttag accaaatgac agcagggttc      600
aaccgaaatg atttaattat ccttgacgcg cgtccatctg taggtaagac tgcgttcgca      660
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ctagagatgg gtgctgatca gttagccaca cgtatgattt gtagttctgg aaatgttgac      780
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gcattaagtc agttatctcg tgggtgttgaa caacgacaag ataaacgtcc aatgatgagt     1140
gatattcggtg aatctgggtc gattgagcaa gatgccgata tcgttgcatc cttataccgt     1200
gatgattact ataaccgtgg cggcgatgaa gatgatgacg atgatggtgg tttcgagcca     1260
caaacgaatg atgaaaacgg tgaaattgaa attatcattg ctaagcaacg taacggtcca     1320
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<211> 454
<212> PRT
<213> Bacillus subtilis

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Met Thr Asp Leu Leu Asn Asp Arg Leu Pro Pro Gln Asn Ile Glu Ala
1           5           10          15

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Glu Gln Ala Val Leu Gly Ala Ile Phe Leu Gln Pro Ser Ala Leu Thr
20           25           30

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Leu Ala Ser Glu Val Leu Ile Pro Asp Asp Phe Tyr Arg Met Ser His

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35	40	45	
Gln Lys Ile Tyr Asn Ala Met Leu Val Leu Gly Asp Arg Gly Glu Pro			
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Val Asp Leu Val Thr Val Thr Ser Glu Leu Ala Asn Thr Asp Leu Leu			
65	70	75	80
Glu Glu Val Gly Gly Ile Ser Tyr Leu Thr Asp Ile Ala Asn Ser Val			
	85	90	95
Pro Thr Ala Ala Asn Ile Glu Tyr Tyr Ala Lys Ile Val Glu Glu Lys			
	100	105	110
Ser Ile Leu Arg Arg Leu Ile Arg Thr Ala Thr Thr Ile Ala Gln Asp			
	115	120	125
Gly Tyr Thr Arg Glu Asp Glu Val Glu Asp Leu Leu Ser Glu Ala Glu			
	130	135	140
Lys Thr Ile Met Glu Val Ala Gln Arg Lys Asn Thr Ser Ala Phe Gln			
145	150	155	160
Asn Ile Lys Asp Val Leu Val Gln Thr Tyr Asp Asn Ile Glu Gln Leu			
	165	170	175
Tyr Asn Arg Lys Gly Asp Ile Thr Gly Ile Pro Thr Gly Phe Thr Glu			
	180	185	190
Leu Asp Arg Met Thr Ala Gly Phe Gln Arg Asn Asp Leu Ile Ile Val			
	195	200	205
Ala Ala Arg Pro Ser Val Gly Lys Thr Ala Phe Ala Leu Asn Ile Ala			
	210	215	220
Gln Asn Val Ala Thr Lys Thr Asp Glu Ser Val Ala Ile Phe Ser Leu			
225	230	235	240
Glu Met Gly Ala Glu Gln Leu Val Met Arg Met Leu Cys Ala Glu Gly			
	245	250	255
Asn Ile Asn Ala Gln Asn Leu Arg Thr Gly Asn Leu Thr Glu Glu Asp			
	260	265	270

Trp Gly Lys Leu Thr Met Ala Met Gly Ser Leu Ser Asn Ser Gly Ile
 275 280 285

Tyr Ile Asp Asp Thr Pro Gly Ile Arg Val Ser Glu Ile Arg Ala Lys
 290 295 300

Cys Arg Arg Leu Lys Gln Glu Ser Gly Leu Gly Met Ile Leu Ile Asp
 305 310 315 320

Tyr Leu Gln Leu Ile Gln Gly Ser Gly Arg Ser Lys Asp Asn Arg Gln
 325 330 335

Gln Glu Val Ser Glu Ile Ser Arg Glu Leu Lys Ser Ile Ala Arg Glu
 340 345 350

Leu Gln Val Pro Val Ile Ala Leu Ser Gln Leu Ser Arg Gly Val Glu
 355 360 365

Gln Arg Gln Asp Lys Arg Pro Met Met Ser Asp Ile Arg Glu Ser Gly
 370 375 380

Ser Ile Glu Gln Asp Ala Asp Ile Val Ala Phe Leu Tyr Arg Asp Asp
 385 390 395 400

Tyr Tyr Asp Lys Glu Thr Glu Asn Lys Asn Ile Ile Glu Ile Ile Ile
 405 410 415

Ala Lys Gln Arg Asn Gly Pro Val Gly Thr Val Ser Leu Ala Phe Val
 420 425 430

Lys Glu Tyr Asn Lys Phe Val Asn Leu Glu Arg Arg Phe Asp Asp Ala
 435 440 445

Gly Val Pro Pro Gly Ala
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<210> 9
 <211> 466
 <212> PRT
 <213> Staphylococcus aureus

<400> 9

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 Thr Thr Gln Glu Val Leu Leu Pro Glu Ser Phe Tyr Arg Gly Ala His
 35 40 45
 Gln His Ile Phe Arg Ala Met Met His Leu Asn Glu Asp Asn Lys Glu
 50 55 60
 Ile Asp Val Val Thr Leu Met Asp Gln Leu Ser Thr Glu Gly Thr Leu
 65 70 75 80
 Asn Glu Ala Gly Gly Pro Gln Tyr Leu Ala Glu Leu Ser Thr Asn Val
 85 90 95
 Pro Thr Thr Arg Asn Val Gln Tyr Tyr Thr Asp Ile Val Ser Lys His
 100 105 110
 Ala Leu Lys Arg Arg Leu Ile Gln Thr Ala Asp Ser Ile Ala Asn Asp
 115 120 125
 Gly Tyr Asn Asp Glu Leu Glu Leu Asp Ala Ile Leu Ser Asp Ala Glu
 130 135 140
 Arg Arg Ile Leu Glu Leu Ser Ser Ser Arg Glu Ser Asp Gly Phe Lys
 145 150 155 160
 Asp Ile Arg Asp Val Leu Gly Gln Val Tyr Glu Thr Ala Glu Glu Leu
 165 170 175
 Asp Gln Asn Ser Gly Gln Thr Pro Gly Ile Pro Thr Gly Tyr Arg Asp
 180 185 190
 Leu Asp Gln Met Thr Ala Gly Phe Asn Arg Asn Asp Leu Ile Ile Leu
 195 200 205
 Ala Ala Arg Pro Ser Val Gly Lys Thr Ala Phe Ala Leu Asn Ile Ala
 210 215 220
 Gln Lys Val Ala Thr His Glu Asp Met Tyr Thr Val Gly Ile Phe Ser

225		230		235		240
Leu Glu Met Gly	Ala Asp Gln Leu Ala Thr Arg Met Ile Cys Ser Ser					
	245		250		255	
Gly Asn Val Asp	Ser Asn Arg Leu Arg Thr Gly Thr Met Thr Glu Glu					
	260		265		270	
Asp Trp Ser Arg Phe Thr Ile Ala Val Gly Lys Leu Ser Arg Thr Lys						
	275		280		285	
Ile Phe Ile Asp Asp Thr Pro Gly Ile Arg Ile Asn Asp Leu Arg Ser						
	290		295		300	
Lys Cys Arg Arg Leu Lys Gln Glu His Gly Leu Asp Met Ile Val Ile						
305		310		315		320
Asp Tyr Leu Gln Leu Ile Gln Gly Ser Gly Ser Arg Ala Ser Asp Asn						
	325		330		335	
Arg Gln Gln Glu Val Ser Glu Ile Ser Arg Thr Leu Lys Ala Leu Ala						
	340		345		350	
Arg Glu Leu Glu Cys Pro Val Ile Ala Leu Ser Gln Leu Ser Arg Gly						
	355		360		365	
Val Glu Gln Arg Gln Asp Lys Arg Pro Met Met Ser Asp Ile Arg Glu						
	370		375		380	
Ser Gly Ser Ile Glu Gln Asp Ala Asp Ile Val Ala Phe Leu Tyr Arg						
385		390		395		400
Asp Asp Tyr Tyr Asn Arg Gly Gly Asp Glu Asp Asp Asp Asp Asp Gly						
	405		410		415	
Gly Phe Glu Pro Gln Thr Asn Asp Glu Asn Gly Glu Ile Glu Ile Ile						
	420		425		430	
Ile Ala Lys Gln Arg Asn Gly Pro Thr Gly Thr Val Lys Leu His Phe						
	435		440		445	
Met Lys Gln Tyr Asn Lys Phe Thr Asp Ile Asp Tyr Ala His Ala Asp						
	450		455		460	

Met Met
465

<210> 10
<211> 313
<212> PRT
<213> Staphylococcus aureus

<400> 10

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1 5 10 15

Thr Ser Gln Asp Phe Glu Lys Arg Ile Glu Lys Ile Lys Lys Glu Val
20 25 30

Ile Asn Asp Pro Asp Val Lys Gln Phe Leu Glu Ala His Arg Ala Glu
35 40 45

Leu Thr Asn Ala Met Ile Asp Glu Asp Leu Asn Val Leu Gln Glu Tyr
50 55 60

Lys Asp Gln Gln Lys His Tyr Asp Gly His Lys Phe Ala Asp Cys Pro
65 70 75 80

Asn Phe Val Lys Gly His Val Pro Glu Leu Tyr Val Asp Asn Asn Arg
85 90 95

Leu Lys Ile Arg Tyr Leu Gln Cys Pro Cys Lys Ile Lys Tyr Asp Glu
100 105 110

Glu Arg Phe Glu Ala Glu Leu Ile Thr Ser His Asn Met Gln Arg Asp
115 120 125

Thr Leu Asn Ala Lys Leu Lys Asp Leu Tyr Met Asn His Arg Asp Arg
130 135 140

Leu Asp Val Ala Met Ala Ala Asp Asp Ile Cys Thr Ala Ile Thr Asn
145 150 155 160

Gly Glu Gln Val Lys Gly Leu Tyr Leu Tyr Gly Pro Phe Gly Thr Gly
165 170 175

Lys Ser Phe Leu Leu Gly Ala Ile Ala Asn Gln Leu Lys Ser Lys Lys
 180 185 190

Val Arg Ser Thr Ile Ile Tyr Leu Pro Glu Phe Ile Arg Thr Leu Lys
 195 200 205

Gly Gly Phe Lys Asp Gly Ser Phe Glu Lys Lys Leu His Arg Val Arg
 210 215 220

Glu Ala Asn Ile Leu Met Leu Asp Asp Ile Gly Ala Glu Glu Val Thr
 225 230 235 240

Pro Trp Val Arg Asp Glu Val Ile Gly Pro Leu Leu His Tyr Arg Met
 245 250 255

Val His Glu Leu Pro Thr Phe Phe Ser Ser Asn Phe Asp Tyr Ser Glu
 260 265 270

Leu Glu His His Leu Ala Met Thr Arg Asp Gly Glu Glu Lys Thr Lys
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Ala Ala Arg Ile Ile Glu Arg Val Lys Ser Leu Ser Thr Pro Tyr Phe
 290 295 300

Leu Ser Gly Glu Asn Phe Arg Asn Asn
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<210> 11
 <211> 12
 <212> PRT
 <213> Staphylococcus aureus

<220>
 <221> misc_feature
 <223> predicted tryptic peptide

<400> 11

Gly His Val Pro Glu Leu Tyr Val Asp Asn Asn Arg
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<210> 12
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 <212> PRT
 <213> Staphylococcus aureus

<220>
<221> misc_feature
<223> predicted tryptic peptide

<400> 12

Ser Thr Ile Ile Tyr Leu Pro Glu Phe Ile Arg
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<210> 13
<211> 14
<212> PRT
<213> Staphylococcus aureus

<220>
<221> misc_feature
<223> predicted tryptic peptide

<400> 13

Ser Leu Ser Thr Pro Tyr Phe Leu Ser Gly Glu Asn Phe Arg
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<210> 14
<211> 280
<212> PRT
<213> Bacillus subtilis

<400> 14

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1 5 10 15

Gln Lys Met Ile Glu Lys Ser Leu Asn Lys Leu Tyr Glu Tyr Ile Glu
20 25 30

Gln Ser Lys Asn Cys Ser Tyr Cys Ser Glu Asp Glu Asn Cys Asn Asn
35 40 45

Leu Leu Glu Gly Tyr His Pro Lys Leu Val Val Asn Gly Arg Ser Ile
50 55 60

Asp Ile Glu Tyr Tyr Glu Cys Pro Val Lys Arg Lys Leu Asp Gln Gln
65 70 75 80

Lys Lys Gln Gln Ser Leu Met Lys Ser Met Tyr Ile Gln Gln Asp Leu
85 90 95

Leu Gly Ala Thr Phe Gln Gln Val Asp Ile Ser Asp Pro Ser Arg Leu
100 105 110

Ala Met Phe Gln His Val Thr Asp Phe Leu Lys Ser Tyr Asn Glu Thr
115 120 125

Gly Lys Gly Lys Gly Leu Tyr Leu Tyr Gly Lys Phe Gly Val Gly Lys
130 135 140

Thr Phe Met Leu Ala Ala Ile Ala Asn Glu Leu Ala Glu Lys Glu Tyr
145 150 155 160

Ser Ser Met Ile Val Tyr Val Pro Glu Phe Val Arg Glu Leu Lys Asn
165 170 175

Ser Leu Gln Asp Gln Thr Leu Glu Glu Lys Leu Asn Met Val Lys Thr
180 185 190

Thr Pro Val Leu Met Leu Asp Asp Ile Gly Ala Glu Ser Met Thr Ser
195 200 205

Trp Val Arg Asp Glu Val Ile Gly Thr Val Leu Gln His Arg Met Ser
210 215 220

Gln Gln Leu Pro Thr Phe Phe Ser Ser Asn Phe Ser Pro Asp Glu Leu
225 230 235 240

Lys His His Phe Thr Tyr Ser Gln Arg Gly Glu Lys Glu Glu Val Lys
245 250 255

Ala Ala Arg Leu Met Glu Arg Ile Leu Tyr Leu Ala Ala Pro Ile Arg
260 265 270

Leu Asp Gly Glu Asn Arg Arg His
275 280

<210> 15

<211> 278

<212> PRT

<213> Bacillus halodurans

<400> 15

Pro His Val Gln Leu Phe Leu Glu Glu His Pro Ser Leu Ser Pro Ile

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Leu	Ser	Lys	Leu
Tyr	Glu	Tyr	Gln
Lys	Glu	Gln	
Ser	His	Cys	Ala
35		40	45
His	Cys	Pro	Gly
Leu	Gln	Lys	Cys
Pro	Asn	Leu	Met
Lys	Gly	Tyr	Gln
50		55	60
Pro	Thr	Leu	Tyr
Val	Glu	Arg	Asp
Ser	Leu	Glu	Leu
Ser	Tyr	Ser	Pro
65		70	75
Cys	Pro	Leu	Lys
Glu	Glu	Glu	Glu
Arg	Glu	Lys	Lys
Lys	Arg	Ser	Leu
Ile	Arg	Ser	Leu
85		90	95
Thr	Leu	Tyr	Ile
Pro	Lys	Glu	Ile
Leu	Glu	Leu	Glu
Ala	Lys	Phe	Asp
100		105	110
Asp	Val	Glu	Ser
Glu	Pro	Gly	Arg
Ser	Ile	Ala	Ser
His	Arg	Ala	Leu
115		120	125
Glu	Phe	Ala	Leu
Ser	Ala	Lys	Pro
Gly	Glu	Asp	Gly
Met	Gly	Leu	Tyr
130		135	140
Leu	Tyr	Gly	Lys
Phe	Gly	Val	Gly
Lys	Thr	Phe	Leu
Met	Gly	Ala	Ile
145		150	155
Ala	Asn	Glu	Leu
Lys	Asp	Arg	Gly
Ile	Asp	Ser	Thr
Ile	Val	Tyr	Val
165		170	175
Pro	Asp	Phe	Phe
Arg	Glu	Leu	Lys
Gln	Ser	Ile	Gly
Asp	Gly	Thr	Phe
180		185	190
Gln	Gln	Lys	Leu
Asp	Phe	Val	Lys
Asn	Ala	Gln	Val
Leu	Ile	Phe	Asp
195		200	205
Asp	Ile	Gly	Ala
Glu	Thr	Met	Thr
Ser	Trp	Val	Arg
Asp	Asp	Val	Leu
210		215	220
Gly	Val	Ile	Leu
Gln	Tyr	Arg	Ile
Met	Glu	Lys	Leu
Pro	Thr	Leu	Phe
225		230	235
Ser	Asn	Tyr	Asp
Tyr	Asp	Tyr	Asp
Glu	Leu	Glu	Glu
His			
240			

Leu Ala Tyr Asn Asp Lys Ser Gly Thr Glu Leu Leu Lys Ala Lys Arg
 245 250 255

Val Met Glu Arg Ile Arg His Tyr Thr Val Ser Val Met Val Gln Gly
 260 265 270

Gln Asn Arg Arg Glu His
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<210> 16
 <211> 164
 <212> PRT
 <213> Staphylococcus aureus

<400> 16

Ala Ala Asp Asp Ile Cys Thr Ala Ile Thr Asn Gly Glu Gln Val Lys
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 20 25 30

Gly Ala Ile Ala Asn Gln Leu Lys Ser Lys Lys Val Arg Ser Thr Ile
 35 40 45

Ile Tyr Leu Pro Glu Phe Ile Arg Thr Leu Lys Gly Gly Phe Lys Asp
 50 55 60

Gly Ser Phe Glu Lys Lys Leu His Arg Val Arg Glu Ala Asn Ile Leu
 65 70 75 80

Met Leu Asp Asp Ile Gly Ala Glu Glu Val Thr Pro Trp Val Arg Asp
 85 90 95

Glu Val Ile Gly Pro Leu Leu His Tyr Arg Met Val His Glu Leu Pro
 100 105 110

Thr Phe Phe Ser Ser Asn Phe Asp Tyr Ser Glu Leu Glu His His Leu
 115 120 125

Ala Met Thr Arg Asp Gly Glu Glu Lys Thr Lys Ala Ala Arg Ile Ile
 130 135 140

Glu Arg Val Lys Ser Leu Ser Thr Pro Tyr Phe Leu Ser Gly Glu Asn
 145 150 155 160

Phe Arg Asn Asn

<210> 17
 <211> 495
 <212> DNA
 <213> Staphylococcus aureus

<400> 17
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 <213> Staphylococcus aureus

<400> 18

Tyr Lys Asp Gln Gln Lys His Tyr Asp Gly His Lys Phe Ala Asp Cys
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Pro Asn Phe Val Lys Gly His Val Pro Glu Leu Tyr Val Asp Asn Asn
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Arg Ile Lys Ile Arg Tyr Leu Gln Cys Pro Cys Lys Ile Lys Tyr Asp
 35 40 45

Glu Glu Arg Phe Glu Ala Glu Leu Ile Thr Ser His His Met Gln Arg
 50 55 60

Asp Thr Leu Asn Ala Lys Leu Lys Asp Ile Tyr Met Asn His Arg Asp

65	70	75	80
Arg Leu Asp Val	Ala Met Ala Ala Asp	Asp Ile Cys Thr Ala	Ile Thr
	85	90	95
Asn Gly Glu Gln Val	Lys Gly Leu Tyr	Leu Tyr Gly Pro	Phe Gly Thr
	100	105	110
Gly Lys Ser Phe Ile	Leu Gly Ala Ile	Ala Asn Gln Leu	Lys Ser Lys
	115	120	125
Lys Val Arg Ser Thr	Ile Ile Tyr Leu	Pro Glu Phe Ile	Arg Thr Leu
	130	135	140
Lys Gly Gly Phe Lys	Asp Gly Ser Phe	Glu Lys Lys Leu	His Arg Val
	145	150	155
Arg Glu Ala Asn Ile	Leu Met Leu Asp	Asp Ile Gly Ala	Glu Glu Val
	165	170	175
Thr Pro Trp Val Arg	Asp Glu Val Ile	Gly Pro Leu Leu	His Tyr Arg
	180	185	190
Met Val His Glu Leu	Pro Thr Phe Phe	Ser Ser Asn Phe	Asp Tyr Ser
	195	200	205
Glu Leu Glu His His	Leu Ala Met Thr	Arg Asp Gly Glu	Glu Lys Thr
	210	215	220
Lys Ala Ala Arg Ile	Ile Glu Arg Val	Lys Ser Leu Ser	Thr Pro Tyr
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Phe Leu Ser Gly Glu	Asn Phe Arg Asn	Asn	
	245	250	

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 <212> PRT
 <213> Staphylococcus aureus

<400> 19

Gly His Val Pro	Glu Asn Val Thr	Asp Asn Asp Arg
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